Electronic Version
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Claims

[c1] 1. An elevator position compensation system for minimizing re-leveling of an elevator car in an elevator shaft, the elevator car suspended in the shaft by an elevator cable system and elevator motor, the elevator position compensation system comprising:
(a) an elevator load sensor device for determining the weight of the elevator car and generating a load signal indicative of the determined weight;
(b) an elevator position sensor for determining the position of the elevator car in the elevator shaft and generating a position signal indicative of the determined elevator car position; and
(c) an elevator control system adapted to receive the load signal and the position signal, wherein the load signal and position signal are processed by the control system in order to calculate a change in the cable system length associated with a load change in the elevator car, and wherein the calculated change in the cable system length is compensated by the elevator motor when the elevator car is at a landing.

[c2] 2. The elevator position compensation system according

to claim 1, wherein the elevator control system comprises cable system data associated with the cable system characteristics, wherein the control system processes the cable system data in order to calculate the change in the cable system length.

[c3] 3. The elevator position compensation system according to claim 1, wherein the elevator cable system comprises at least one aramid fiber rope.

[c4] 4. The elevator position compensation system according to claim 1, wherein the elevator cable system comprises at least one wire rope.

[c5] 5. The elevator position compensation system according to claim 1, wherein the elevator cable system comprises at least one coated steel belt.

[c6] 6. The elevator position compensation system according to claim 1, wherein the elevator cable system comprises at least one composite belt.

[c7] 7. The elevator position compensation system according to claim 2, wherein the cable system data comprises the cable system cross sectional area.

[c8] 8. The elevator position compensation system according to claim 2, wherein the cable system data comprises a

modulus of elasticity associated with cable system.

[c9] 9. The elevator position compensation system according to claim 2, wherein the cable system data comprises an integer number associated with a number of cables within the cable system.

[c10] 10. A method of minimizing re-leveling in an elevator system comprising an elevator car suspended by an elevator cable system, the method comprising the steps of:
(a) determining the weight differential associated with the elevator car based on load changes;
(b) determining characteristic information associated with the cable system;
(c) determining length change information associated with the cable system based on the measured weight differential and the determined characteristic information; and
(d) adjusting the cable system length by an amount based on the determined length change information.

[c11] 11. The method according to claim 10, wherein the weight differential is the difference between a measured weight of the elevator car and an inferred weight of the elevator car, wherein the inferred weight is predicted based on elevator activity information.

[c12] 12. The method according to claim 11, wherein the elevator activity information comprises a car-call signal.

[c13] 13. The method according to claim 11, wherein the elevator activity information comprises a hall-call signal.

[c14] 14. The method according to claim 11, wherein the elevator activity information comprises a hall-call signal and a car-call signal.

[c15] 15. The method according to claim 11, wherein the elevator activity information comprises statistical load changes in the elevator car based on time-of-day.

[c16] 16. The method according to claim 11, wherein the elevator activity information comprises hall call request information associated with at least one floor number.

[c17] 17. The method according to claim 10, wherein the determined characteristic information associated with the cable system comprises the length of the cable system.

[c18] 18. The method according to claim 10, wherein the determined characteristic information associated with the cable system comprises a cross sectional area.

[c19] 19. The method according to claim 10, wherein the determined characteristic information associated with the cable system comprises a modulus of elasticity.

[c20] 20. The method according to claim 10, wherein the determined characteristic information associated with the cable system comprises an integer number associated with a number of cables within the cable system.

[c21] 21. The method according to claim 10, wherein the adjusted cable system length compensates for a length increase in the cable system due to a load increase.

[c22] 22. The method according to claim 10, wherein the adjusted cable system length compensates for a length decrease in the cable system due to a load reduction.

[c23] 23. A method of minimizing re-leveling in an elevator system, the elevator system comprising an elevator car suspended in an elevator shaft by an elevator cable system, and an elevator system controller for controlling an elevator motor, wherein the elevator motor transfers motion to the cable system so that the elevator car may move within the elevator shaft, the method comprising the steps of:

(a) transferring data associated with the weight of the elevator car to the elevator system controller;

(b) transferring data associated with the position of the elevator car to the system controller in order to calculate the length of the elevator cable system;

(c) calculating a change in the length of the elevator cable system at the elevator system controller based on the calculated length of the elevator cable system and the data associated with the weight of the elevator car;
(d) generating a control signal at the system controller based on the calculated change in the length of the elevator cable system; and
(e) sending the generated control signal to the elevator motor for adjusting the length of the of the elevator cable system in order to compensate for the calculated change in the length of the elevator cable system.

[c24] 24. The method according to claim 23, wherein the generated control signal is an analog signal.

[c25] 25. The method according to claim 23, wherein the generated control signal is a digital signal.

[c26] 26. The method according to claim 23, wherein adjusting the length of the cable system comprises reducing the length of the cable system by an amount substantially the same as the calculated change in the length of the elevator cable system, when a load increase in the elevator car is predicted.

[c27] 27. The method according to claim 23, wherein adjusting the length of the cable system comprises increasing the

length of the cable system by an amount substantially the same as the calculated change in the length of the elevator cable system, when a load decrease in the elevator car is predicted.

[c28] 28. The method according to claim 23, wherein the data associated with the weight of the elevator car comprises a calculated difference between a measured weight of the elevator car and an inferred weight of the elevator car, wherein the inferred weight is predicted based on elevator activity information.